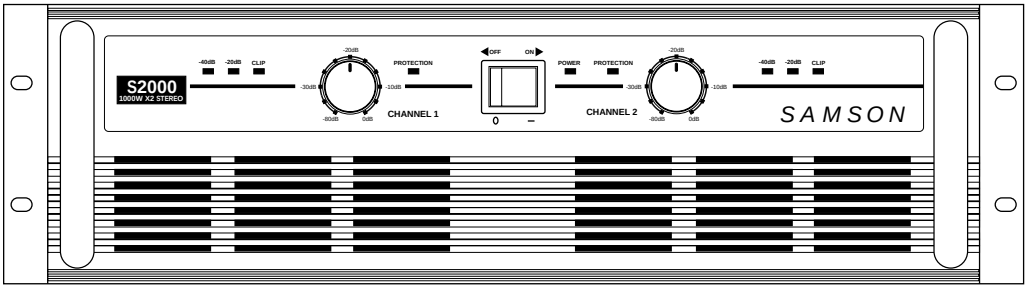
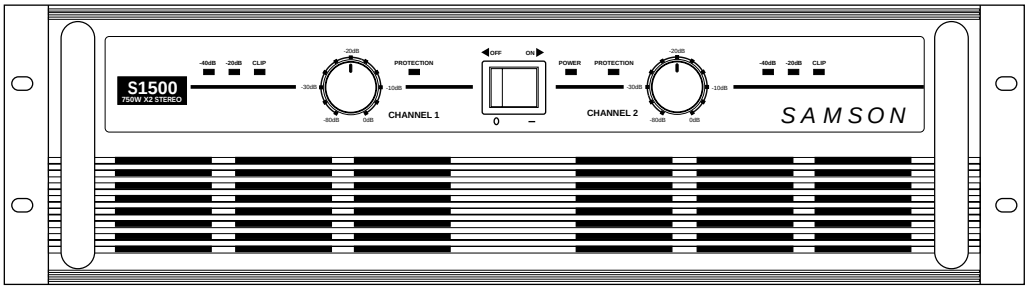
S1500 / S2000

POWER AMPLIFIER





OWNERS MANUAL

SAMSON®

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Introduction

We know you don't like reading owners manuals, but you've just purchased one of the finest sound reinforcement power amplifiers around, and we want to tell you about it! So, before you plug in, we'd like to suggest you take just a few moments out to scan these pages. We'll make it as painless as possible, we promise—and, who knows, you might just pick up a tip or two.

The Samson S1500 / S2000 is a three rack-space stereo power amplifier which is optimized for live sound venues, commercial installations, and for driving medium and large-sized PA systems. Fan-cooled for maximum thermal protection, the S1500 delivers 750 watts of power per channel (or, in Bridged mode, 1500 watts), and the S2000 provides a whopping 1000 watts of power per channel (or, in Bridged mode, 2000 watts), over the full frequency spectrum, from 10 Hz to 55 kHz. Combination connectors allow both balanced XLR and balanced 1/4" TRS input connections; output connections are provided on both standard banana and advanced Speakon™ connectors. Front-panel controls and displays include a power switch and LED, as well as independent left- and right-channel input level controls, three-segment LED meters, and Protection LEDs.

In these pages, you'll find a detailed description of the many features of the S1500 / S2000 power amplifier, as well as a guided tour through its front and rear panels, step-by-step instructions for its setup and use, and full specifications. You'll also find a warranty card enclosed—please don't forget to fill it out and mail it in so that you can receive online technical support and so we can send you updated information about these and other Samson products in the future. Also, be sure to check out our website (http://www.samsontech.com) for complete information about our full product line.

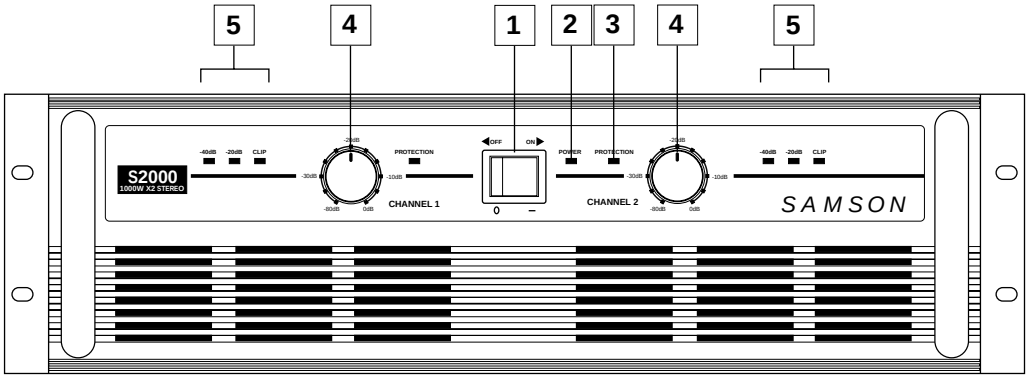
SPECIAL NOTE: Should your S1500 or S2000 ever require servicing, a *Return Authorization* number (RA) is necessary. Without this number, the unit will not be accepted. If purchased in the United States, please call Samson at 1-800-372-6766 for a Return Authorization number prior to shipping the unit. If purchased outside the United States, contact your local Samson dealer for details. Please retain the original packing materials and, if possible, return the unit in its original carton and packing materials.

S1500 / S2000 Features

The Samson S1500 / S2000 power amplifier utilizes the latest technology in professional power amplifier design. Here are some of its main features:

- Power to spare - In the S1500, each channel delivers 750 watts of power into 4 ohms. In the S2000, each channel delivers 1000 watts of power into 4 ohms.
- A Bridged mode links both channels, thus providing additional power (1500 watts into 8 ohms in the case of the S1500; 2000 watts into 8 ohms in the case of the S2000).
- XLR link outputs, allowing multiple amplifiers to be “daisy-chained” together for even *more* power. Plus, the utilization of advanced circuitry and direct wiring ensures that there is no distortion in slaved amplifiers even when the first amp in the daisy-chain is powered off.
- Clean, crisp sound - Impressive audio specifications such as 0.04% THD, dynamic range of greater than 100 dB, crosstalk of 78 dB, and frequency response of 10 Hz to 20 kHz guarantee ultra-clean sound quality.
- Independent 41-position detented input level controls for each channel allow precision adjustments.
- Three-segment LED meters for each channel continuously display power output levels and allow you to correct for overloading (clipping) conditions.
- Unique stable bipolar circuit design for long life and enhanced audio performance. The circuitry continuously keeps DC output at or near 0 volts during idling. This serves to minimize heat overload problems by effectively preventing the S1500 / S2000 from applying power when unnecessary.
- Dual temperature-sensitive speed-controlled fans for reliable cooling without thermal and overheating problems.
- Protection relay circuitry (with dedicated LEDs for each channel) that guards against overheating or faulty wiring conditions and also prevents “thumps” when powering on or off. This means that you can use the S1500 / S2000 with a single power strip into which a mixer or other audio devices are connected, without danger of damage to connected speakers.
- Combination input connectors for each channel accommodate both balanced XLR or balanced 1/4" TRS plugs, as well as both Speakon™ and banana jack output connectors for maximum flexibility.
- Toroidal transformer power supply for high current and low profile.
- User-resettable circuit breaker for fast, easy startup following a power supply overload.
- Supplied user-installable PowerCon™ connector power receptacle.
- The S1500 / S2000 can be mounted in any standard 19" rack (taking just three rack spaces), making it easy to integrate the into any fixed or traveling PA rig.
- Rugged construction (an all-steel chassis with a titanium finish and a lightweight anodized aluminum heat sink) makes the S1500 / S2000 eminently roadworthy.
- Three-year warranty.
- Last but certainly not least, value. The Samson S1500 / S2000 has been designed from the ground up to deliver excellent yet affordable sound quality.

Guided Tour - Front Panel



1: Power switch - Use this to power the S1500 / S2000 on or off.

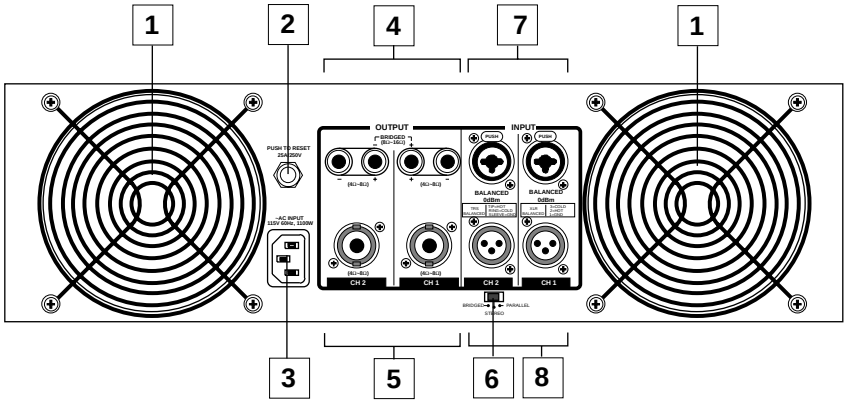
2: Power LED - Lights whenever the S1500 / S2000 is powered on.

3: Protection LED - This goes on for approximately five seconds whenever the S1500 / S2000 is powered on and then turns off (you'll hear a "click" when it does so). The Protection LED will also light when overheating or other severe problems occur (see page 6 in this manual for more information). It is normal for the Protection LED to fade slowly when the amp is powered off. When lit, 0 volts DC are provided to all connected speakers, thus muting them and preventing any "thump" from occurring. For a complete description of the conditions under which this light goes on, see the section entitled "The S1500 / S2000 Protection Circuitry" on page 6 of this manual.

4: Channel input level controls - These 41-position detented knobs allow you to precisely adjust the input level of the signal arriving at the rear-panel input jacks (see #7 on the following page). At their fully counterclockwise position (labeled "-80 dB"), the signal is attenuated by 80 dB (essentially completely off). At their fully clockwise position (labeled "0 dB"), the signal is at unity gain (that is, no attenuation). When 0 dBu of signal arrives at the input jacks and the Channel input level controls are set to their fully clockwise "0 dB" position, the S1500 / S2000 delivers full power output.

5: LED meters - These three-segment LED meters continuously monitor the power output level for the corresponding channel. For convenience, the segments are labeled, from left to right, -40 dB, -20 dB, and CLIP. The left (-40 dB) segment lights whenever input signal is present. The right (CLIP) segment lights whenever the channel is outputting signal at full strength. For the best signal-to-noise ratio, the right (CLIP) segment should light occasionally during peak levels; if it lights frequently, you may be overloading the S1500 / S2000 and a distorted ("clipped") signal is probably being output. If this occurs and backing off the Input Level control delivers too low an output level for your application, consider using Bridged mode (see the "Bridged and Parallel Modes" section on page 7 in this manual for more information).

Guided Tour - Rear Panel



1: Fan - This variable-speed fan provides vital cooling to your S1500 / S2000 (the hotter the amp gets, the faster the fan blows!). Make sure that both the front and rear panels are kept free of all obstructions and that cool, fresh air is accessible at all times. Also, try to ensure that the S1500 / S2000 is used in a dust-free environment.

2: Circuit Breaker - This circuit breaker will trip if there is a fault with the mains voltage or if maximum output is exceeded (very highly distorted). Push it in (once only!) to restart the amplifier.

3: AC input - Connect the supplied heavy-gauge 3-pin “IEC” power cable here. Alternatively, the supplied PowerCon™ connector plate can be attached here.

4: Banana output connectors - Use these to connect each channel of the S1500 / S2000 to 4- or 8-ohm loudspeakers. Be sure to connect the loudspeaker correctly, with the red (+) terminal normally connected to the positive input of the speaker and the black (ground) terminal normally connected to the negative input of the speaker. See page 7 in this manual for more information about Bridged mode and pages 8 and 9 in this manual for full speaker connection instructions.

5: Speakon™ output connectors - Alternatively, you can use these to connect each channel of the S1500 / S2000 to 4- or 8-ohm loudspeakers. See page 7 for more information about Bridged mode and pages 8 and 9 for full Speakon™ connector wiring and interconnection instructions.

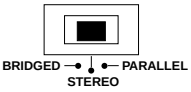
6: Bridged / Stereo / Parallel switch - For normal operation, place this three-way switch in its center (“STEREO”) position. When placed in its right (“PARALLEL”) position, the signal arriving at the Channel 1 input only is routed to the power amplifiers of both Channel 1 and Channel 2 (the Channel 2 input is ignored), with each power amplifier delivering 750 watts into 4 ohms (in the case of the S1500) or 1000 watts into 4 ohms (in the case of the S2000). When placed in its left (“BRIDGED”) position, the signal arriving at the Channel 1 input only is again routed to both power amplifiers (again, the Channel 2 input is ignored), but the two power amplifiers are bridged together, providing 1500 watts of power into 8 ohms (in the case of the S1500) or a full 2000 watts of power into 8 ohms (in the case of the S2000). For more information, see the “Bridged and Parallel Modes” section on page 7 and the “S1500 / S2000 Connections” section on pages 8 -9. **WARNING: Due to the extremely high power output of the S1500 / S2000 when used in Bridged mode, be sure to use only loudspeakers sufficiently rated to handle the resultant wattage (in Bridged mode, these must be 8-ohm speakers).**

7: Input connectors - Connect incoming signal to these electronically balanced Combination connectors, using either XLR or 1/4" TRS (Tip/Ring/Sleeve) plugs, wired as follows: Pin 2 (or Tip) hot, Pin 3 (or Ring) cold, and Pin 1 (or Sleeve) ground. We recommend the use of balanced three-conductor cabling wherever possible (unbalanced two-conductor 1/4" plugs can also be inserted into these inputs, but you’ll get better signal quality and less outside noise and hum if you use balanced lines).
The S1500 / S2000 accepts input levels of any strength but needs at least 0 dBu to achieve maximum power. Stereo signals should be connected to both the Channel 1 and Channel 2 input jacks; however, when operating the S1500 / S2000 in Bridged or Parallel modes, use the Channel 1 input jack only.
See page 7 in this manual for more information about Parallel mode and pages 8 and 9 in this manual for full interconnection instructions.

8: Link connectors - These XLR connectors provide unity gain outputs, allowing the S1500 / S2000 to be daisy-chained to additional power amplifiers. Wiring is as follows: Pin 2 hot, Pin 3 cold, Pin 1 ground. See page 9 in this manual for more information.

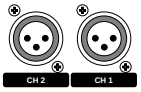
Setting up your S1500 / S2000 is a simple procedure which takes only a few minutes:

1. Remove all packing materials (save them in case of need for future service) and decide where the amplifier is to be physically placed—it can be used free-standing or mounted in a standard 19" rack, requiring only three rack spaces. When installed, make sure that both the front and rear panels are unobstructed and that there is good ventilation around the entire unit (we recommend the use of spacer panels, especially if multiple amplifiers are used in a rack. If required, the supplied alternate PowerCon™ power receptacle should be installed in place of the IEC receptacle at this time.



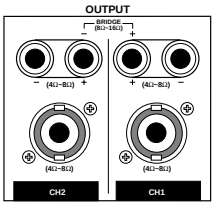
Bridged / Stereo / Parallel switch

2. Set the rear panel Bridged / Stereo / Parallel switch as desired (see the “Bridged and Parallel Modes” section on page 7 in this manual for more information). If desired, use the XLR Link connectors to “daisy-chain” the output of the S1500 / S2000 to external amplifiers (see #8 on page 4 in this manual for more information).



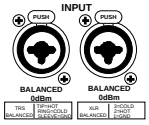
Link connectors

3. Make the speaker connections, using the banana or Speakon™ output connectors on the rear panel. It is never a good idea to power up any amplifier that is not connected to loudspeakers. When operating in Stereo or Parallel mode, any loudspeakers with a minimum impedance load of 4 ohms (that is, 4 ohms or greater) can be used; however, in Bridged mode, 8 ohm speakers **must** be used. Be sure to connect the loudspeaker correctly. In Stereo or Parallel mode, make sure the red (+) terminal is connected to the positive input of the speaker and the black (ground) terminal is connected to the negative input of the speaker. See page 7 in this manual for more information about Bridged mode and pages 8 - 9 in this manual for full speaker interconnection instructions.



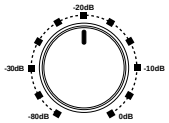
Output connectors

4. Next, make the signal input connections, using the Combination input connectors on the rear panel (if operating the S1500 / S2000 in Bridged or Parallel mode, use the Channel 1 input only—see page 7 in this manual for more information). If your mixer or crossover network has balanced outputs, we recommend the use of three-conductor cabling and connectors (unbalanced two-conductor plugs can also be inserted into the Combo inputs, but you’ll get better signal quality and less outside noise and hum if you use balanced lines).



Input connectors

5. On the front panel of the S1500 / S2000, turn both Channel input controls fully counterclockwise (to their “-80” setting). Then connect the supplied heavy-gauge 3-pin “IEC” cable (or, if the alternate power receptacle is installed, a PowerCon™ cable) to the rear panel power receptacle and to any grounded AC socket. Because of the relay protection circuitry built into the S1500 / S2000, you can even plug it into the same power strip that other audio devices (such as a mixing console) are connected to. You can then turn on all devices at once with the single power strip on-off switch, with no danger of damaging connected speakers by generating “thumps.”

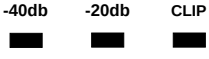


Channel Input control

6. Press the front panel Power switch in order to turn on the S1500 / S2000. The Power LED will light and the Protection LED will go on. After approximately five seconds, the Protection LED will go off (you’ll hear a click when this occurs).

Protection LED

7. Apply an input signal to the S1500 / S2000 at or about 0 dBu (if sending signal from a mixer, drive the output meters at approximately 0 vu). While the input signal is present, slowly raise the Channel Input controls until the desired sound level is achieved.
The three-segment LED meters next to each Channel input control will show you the continuous power output of the S1500 / S2000 as signal is being passed. For the best signal-to-noise ratio, the S1500 / S2000 should normally be run with the Channel Input controls at or near maximum (fully clockwise, at the “0 dB” position) and the right (CLIP) segment should light occasionally (but not frequently) during peak levels. If you are using a mixer that has a master output level control (sometimes called “control room level”), use it to attenuate the signal as necessary to achieve the desired speaker level.



Three-segment LED meter

If you encounter difficulty with any aspect of setting up or using your S1500 or S2000, contact your local Samson dealer. If purchased in the United States, you can call Samson Technical Support (1-800-372-6766) between 9 AM and 5 PM EST.

The S1500 / S2000 Protection Circuitry

As noted in the "Guided Tour" section of this manual, the S1500 / S2000 front-panel Protection LED indicates the activity of the relay speaker connection circuitry. When the Protection LED is lit, this circuitry is active, and all connected speakers are muted (provided with 0 volts DC), thus protecting them and preventing any audible "thump" from occurring.

The following conditions will cause the Protection LED to go on:

• *Initial power-up:* For approximately five seconds after initial power-up, the protection circuitry is activated and the speaker output is muted. If everything is operating normally, you will hear an audible click at the conclusion of this brief period, as the protection circuitry is deactivated and the S1500 / S2000 begins delivering signal to connected speakers (at which point you'll hear a click). It is normal for the Protection LED to fade gradually after the amplifier is powered off.

WARNING: If the Protection LED fails to go out (and you fail to hear the accompanying audible click) approximately five seconds after power-up, turn the S1500 / S2000 off *immediately* and check all external devices and wiring for possible shorts or other defects.

• *Overheating:* A temperature sensing device in the S1500 / S2000 will cause the protection circuitry to be activated (and the Protection LED to go on) whenever the operating temperature of the unit rises above a safe level. To guard against this problem, make sure the S1500 / S2000 receives adequate ventilation on all sides and that both the front and rear panels are unobstructed.

• *Severe overcurrent conditions:* This occurs whenever the signal being input to the S1500 / S2000 rises to a level above 20% THD (Total Harmonic Distortion).

• *Shorted speaker cables:* This will occur if, due to faulty wiring, the hot and ground signals being output by the S1500 / S2000 short one another.

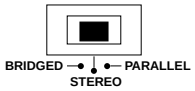
• *Output impedance drops below 2 ohms:* This can occur if the S1500 / S2000 is connected to inappropriate speaker systems (see the "Setting Up and Using Your S1500 / S2000" section on page 5 in this manual for more information).

• *DC voltage detected at speaker output:* The most likely cause of this is an internal failure.

In general, any time the Protection LED lights up (other than during the approximately five seconds following initial power-up), there is reason to be concerned. If this occurs, turn the S1500 / S2000 off immediately and carefully check all wiring and external devices in order to locate and correct the condition that caused the LED to light up in the first place.

For further assistance, contact your local Samson dealer. If purchased in the United States, you can call Samson Technical Support (1-800-372-6766) between 9 AM and 5 PM EST.

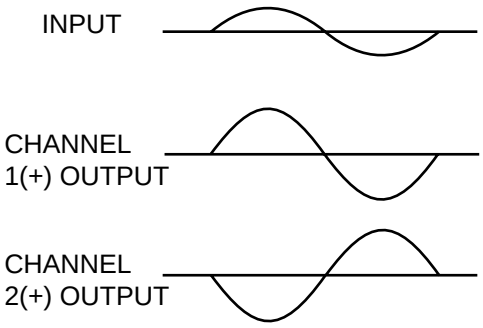
Bridged and Parallel Modes



The S1500 / S2000 provides a rear-panel switch that allows it to be used in either a *Bridged* or *Parallel* mode. When this switch is placed in the "STEREO" (center) position, the S1500 / S2000 functions as a true stereo amplifier, where both of the two independent amplifier channels (Channel 1 and Channel 2) can receive different input signals and produce independent output signals. However, when the switch is placed in the "BRIDGED" (left) position, the Channel 1 inputs signal is routed to both power amplifiers bridged together, producing a single output signal with a true 1500 watt output into a single 8 ohm channel (in the case of the S1500) or a true 2000 watt output into a single 8 ohm channel (in the case of the S2000).

WARNING: Bridged mode is to be used *only* when the S1500 / S2000 is connected to an 8 ohm speaker load. Use of Bridged mode with speaker loads of 4 ohms or less can result in severe damage to the unit due to excessive heat and current limiting and will void your warranty!

Bridged Mode



The illustration on the right shows how this works. In Bridged mode, the polarity (phase) of the Channel 2 output signal is reversed relative to that of the Channel 1 output signal. Both channels then process the same input signal, with the speaker load connected so that power is derived from both channels. The effective voltage swing seen by the load is thus doubled, so that the power output is doubled.

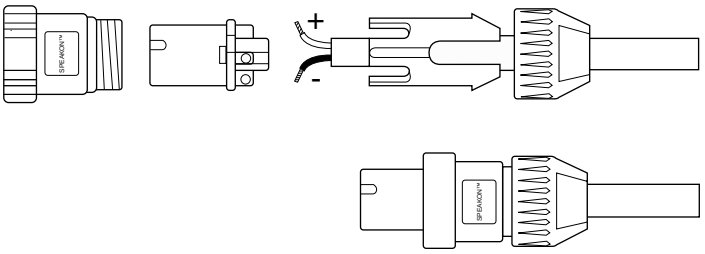
When using the S1500 / S2000 in Bridged mode, be sure to connect your loudspeaker as shown in the illustrations on page 9 (and as silkscreened on the rear panel), with the red (+) terminal of the Channel 2 output connected to the negative input of the speaker and the red (+) terminal of the Channel 1 output connected to the positive input of the speaker. **Do not use the black ground (-) output terminal of either channel (the speaker load must "float" away from the amplifier chassis).**

When the rear panel switch is placed in the right "PARALLEL" position, the S1500 / S2000 operates in a unique Parallel mode. In this mode, only the signal present at the Channel 1 input is used (and only the Channel 1 input control is functional). This signal is then routed to both the Channel 1 and Channel 2 power amplifiers, thus producing a dual mono output, with 750 watts per channel into 4 ohms (in the case of the S1500) or 1000 watts per channel into 4 ohms (in the case of the S2000).

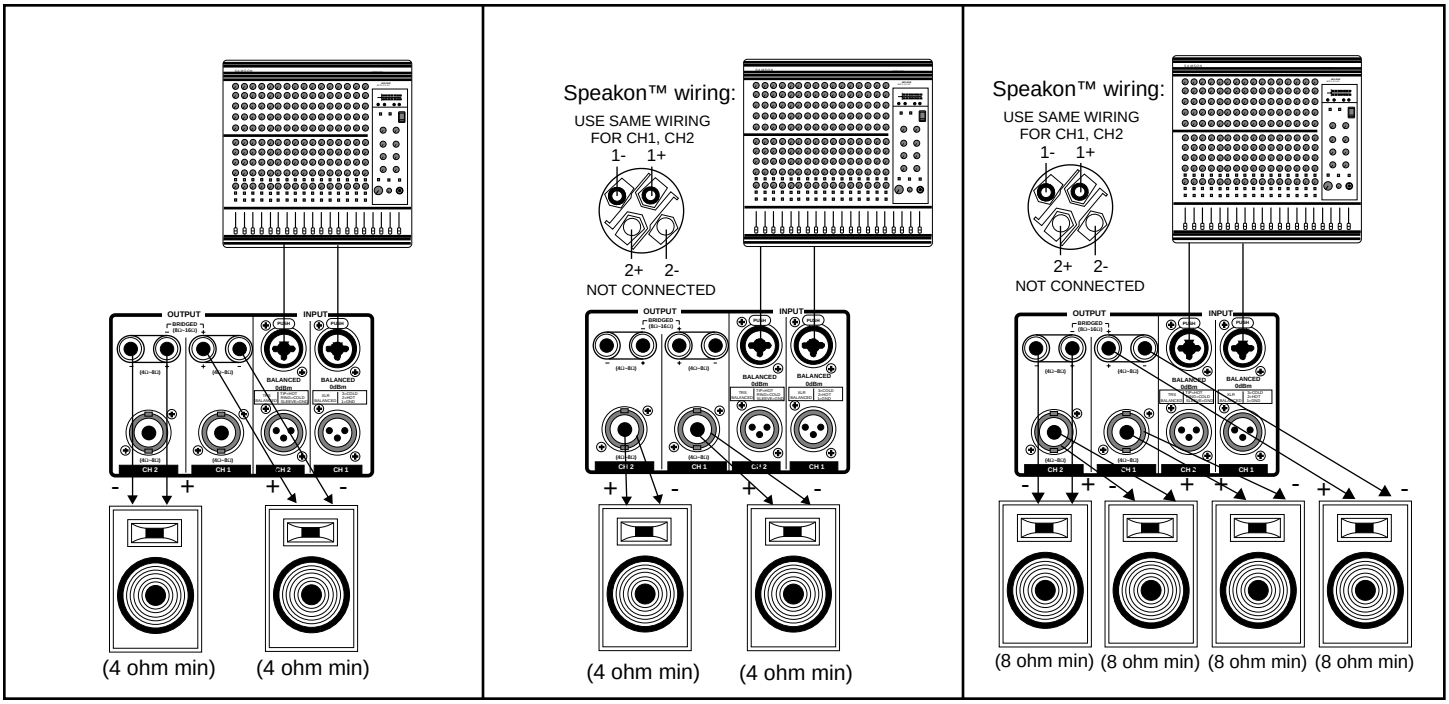
See pages 8 - 9 in this manual for interconnection diagrams when using the S1500 / S2000 in Bridged or Parallel modes

S1500 / S2000 Connections

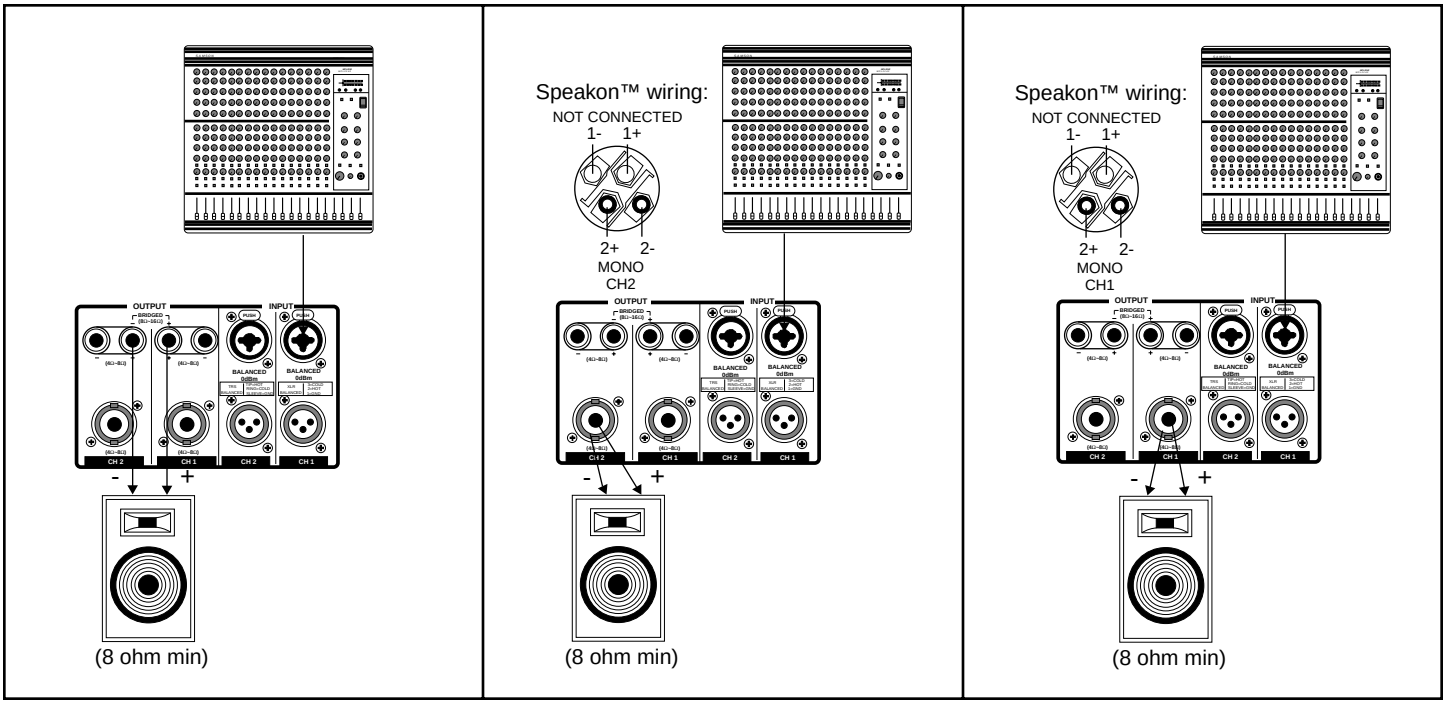
The illustrations on these two pages show the required interconnections when using the S1500 / S2000 in Stereo, Bridged and Parallel modes. Wiring for Speakon™ connectors (shown on the right) is indicated where appropriate.



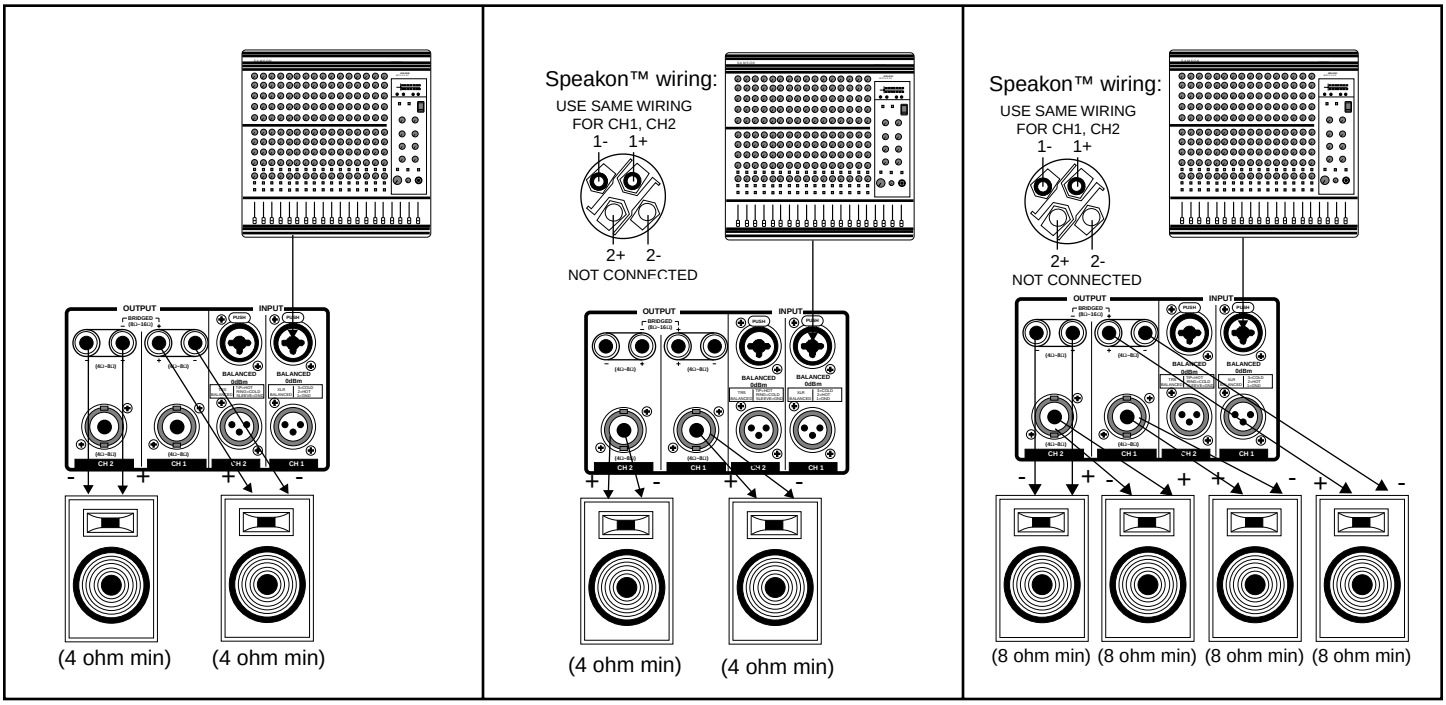
Stereo Mode: (two or four speakers)



Bridged Mode: (single speaker only)

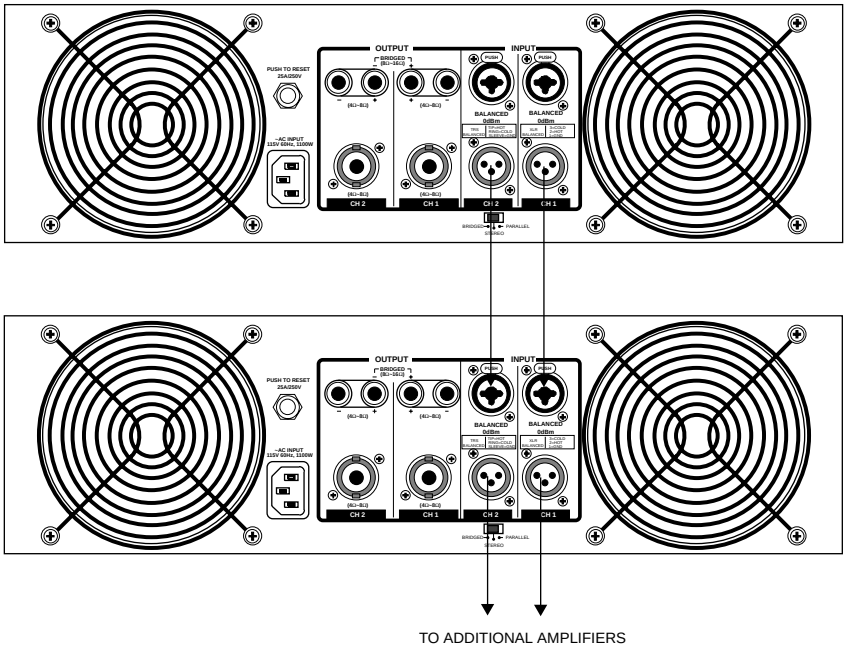


Parallel Mode: (two or four speakers)



Using the S700 / S1000 Link Connectors

The illustration belows shows how multiple amplifiers can be interconnected using the S700 / S1000 link connectors.



Specifications

1. Rated Output Power, per channel (1 kHz, THD 0.1%, Both Ch Drive)	
Stereo / Parallel modes	
S1500, per channel (into 4 ohms)	760 W
S1500, per channel (into 8 ohms)	520 W
S2000, per channel (into 4 ohms)	1045 W
S2000, per channel (into 8 ohms)	670 W
Bridged mode	
S1500, per channel (into 8 ohms)	1520 W
S2000, per channel (into 8 ohms)	2090 W
2. Frequency Response (0 dB, +0, -.5 dB)	10 Hz - 20 kHz
3. Total Harmonic Distortion	
(1/2 power @ 20 Hz - 20 kHz, Both Ch Drive into 4 ohms)	0.04%
4. Dynamic Range	
S1500	102 dB
S2000	101 dB
5. Channel Separation (4 ohm, 125 W, 1 kHz)	78 dB
6. Residual Noise (0 dB ref. = .775 VAC rms, 22 Hz - 22 kHz)	
S1500 (Att. Min.)	-69 dBu
S1500 (Att. Max.)	-67 dBu
S2000 (Att. Min.)	-69 dBu
S2000 (Att. Max.)	-66 dBu
7. Voltage Gain (4 ohm, 1 kHz)	
S1500	37.2 dB
S2000	38.5 dB
8. DC Offset Voltage	0 ± 100 mV
9. Damping Factor	More than 200
10. Indicators	
Clipping LED	1 kHz THD 0.1%
Signal LED Right	-20 dB ± 2 dB
Signal LED Left	-40 dB ± 2 dB
11. Dimensions	19 in (w) x 14.0 (d) x 5.25 (h)
	482 mm (w) x 355 (d) x 133 (h)